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EXTRACELLULAR MATRIX EXPANSION IS MORE STRONGLY ASSOCIATED WITH CARDIOVASCULAR OUTCOMES THAN LEFT VENTRICULAR MASS

Moderated Poster Contributions
Hall C
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Background: Whether myocardial extracellular matrix (ECM) expansion is more strongly associated with outcomes than left ventricular mass index (LVMI) is unknown. Higher mass may reflect myocyte hypertrophy, ECM expansion, or both. Identifying the component most associated with vulnerability may assist efforts to reduce adverse outcomes associated with increased LVMI.

Methods: We enrolled 923 consecutive patients referred for clinical CMR study without myocardial infarction, amyloidosis, stress induced cardiomyopathy, or hypertrophic cardiomyopathy who provided informed consent and subsequently followed within our health system. We quantified LVMI by tracing end-diastolic epicardial and endocardial contours in a short axis stack of steady state free precession images acquired on a 1.5 Tesla scanner (Espree, Siemens), indexing to body surface area. CMR measurement of the extracellular volume fraction (ECV) quantified ECM, using previously published pre and post contrast T1 mapping methods. We averaged ECV from basal and mid ventricular short axis slices, and included regions of atypical late gadolinium enhancement. Hospitalization for heart failure (HHF) and mortality were abstracted from the medical record. Cox regression models determined associations with outcomes. Data were managed using REDCap (Research Electronic Data Capture) and analyzed with SAS 9.3.

Results: Over a median of 1.7 years after CMR, 33 HHF events and 47 deaths occurred in 69 individuals. LVMI correlated weakly with ECV (R2 0.02). Each associated with the combined endpoint of HHF and death in univariable models (HR 1.20 (95%CI 1.09-1.32), chi-square 14.4, p=0.0001; HR 1.66 (95%CI 1.47-1.86), chi-square 70.1, p<0.0001; respectively) as well as multivariable models adjusting for traditional risk predictors. However, LVMI did not significantly associate with outcomes in models including ECV.

Conclusion: ECV exhibited stronger associations with outcomes compared with LVMI. While both ECV and LVMI are components of cardiac remodeling, ECV appears more closely linked with vulnerability. This observation highlights the potential for ECM as a risk stratifier and as a therapeutic target.